



## Traffic Engineering and Parking Divisions

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**Staff Report to Pedestrian-Bicycle-Motor Vehicle Commission  
Request for Adult School Crossing Guard assignment for  
Badger Rock Middle School at the intersection of Rimrock Road and Badger Road  
November 28, 2012**

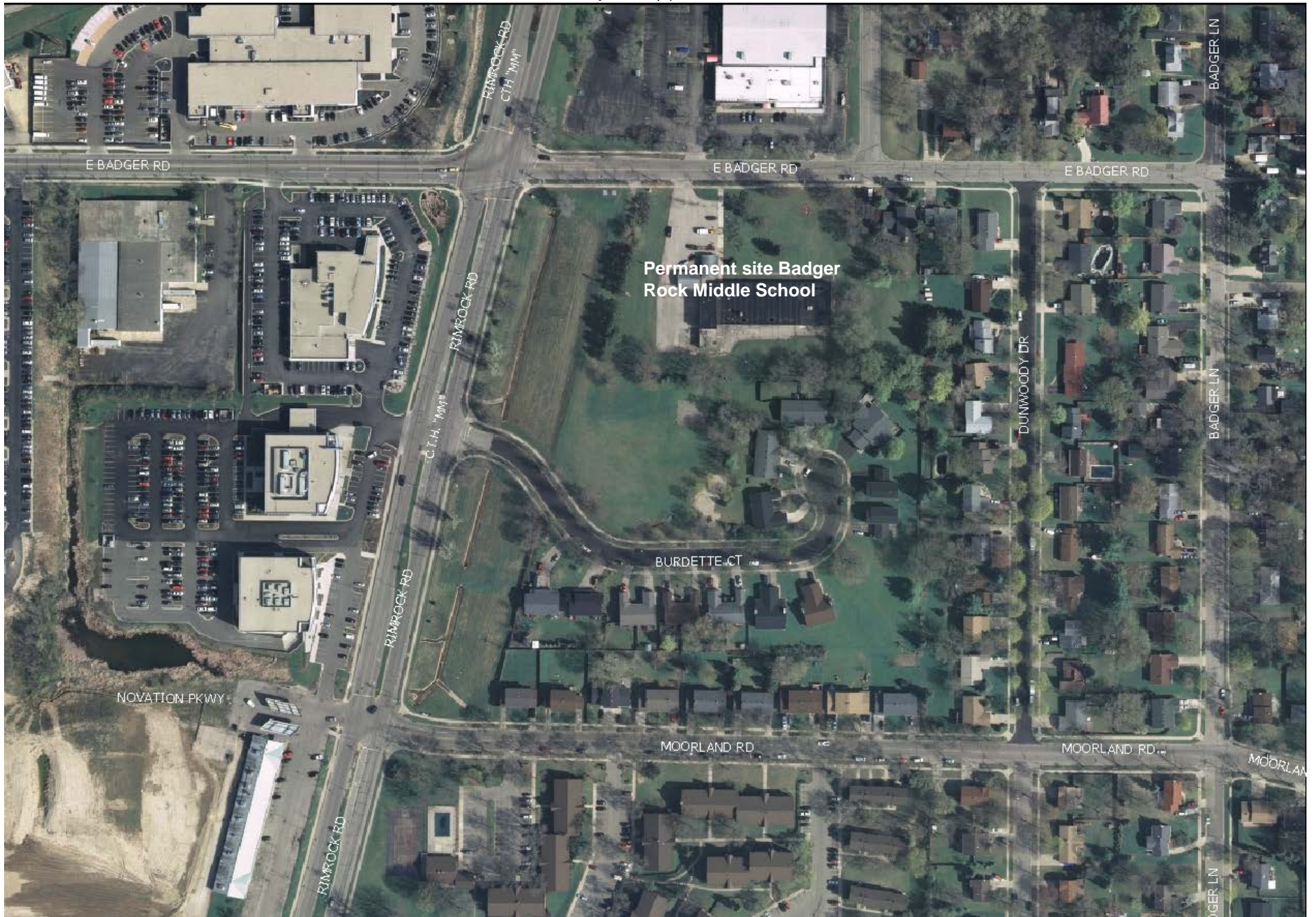
Badger Rock Middle School is a new charter school that opened September 2011 with approximately 50 6<sup>th</sup> grade students. This year a second class of 50 students was added, bringing the school's 2012 - 2013 school year population to 100. Next year a third and final class of 50 students will be added for a capacity of 150 students.

The school moved into its permanent home on the southeast corner of Badger Road at Rimrock. Last year the school was housed in a temporary location on Badger Road just west of Rimrock Road. The majority of students attending Badger Rock living in the neighborhoods within walking and bicycling distance of the school site live in the neighborhood east of Badger Road. There are also some students living in neighborhoods west of Rimrock who can walk to school but need to cross Rimrock to get to school. Students who live outside of the immediate school area take Metro buses that stop on Badger Road west of Rimrock and have to cross Rimrock to from the bus stops to school in the morning, and again to catch the bus home in the afternoon. The Principal and some parents have requested an Adult School Crossing Guard assignment at Rimrock and Badger Roads to assist these students in crossing Rimrock. A similar request was made last year, which the Pedestrian-Bicycle-Motor Vehicle Commission placed on file.

The School Crossing Protection Criteria, which is recommended by the Pedestrian-Bicycle-Motor Vehicle Commission and adopted by the Common Council, does not consider middle school students as part of the evaluation criteria. The assignment of Adult School Crossing Guards, per the adopted policy, is intended only for elementary school aged children. None-the-less, a School Crossing Analysis worksheet for this location is attached. An aerial view of the intersection with the school site labeled is also attached.

The intersection of Rimrock and Badger is signalized. Crosswalks are marked across the south, east and west legs of the intersection. Pedestrian signals with push buttons are in place for the three crossings with marked crosswalks. Dane County has installed advance school crossing signs as well as school crossing signs at the south crosswalk across Rimrock. Traffic Engineering maintains the traffic signal and sets the signal timing. Last year, in response to requests from Badger Rock teachers and students, Traffic Engineering extended the pedestrian crossing cycle for crossing Rimrock by 6 seconds, from 32.5 seconds to 38.5 seconds. This pedestrian cycle does not come on unless the pedestrian button is pushed. Countdown pedestrian signals were also installed.

To Beltline (North ↑)



**SCHOOL CROSSING ANALYSIS**  
**City of Madison**  
**Department of Transportation**  
**Traffic Engineering Division**

School Badger Rock Middle School

Crossing Location Rimrock Road at Badger Road

Elementary School Children Crossing Rimrock Road

					POINTS	
					a.m.	p.m.
<b>1) Number of elementary students crossing</b>	<u>number</u>	<u>points</u>	<u>number</u>	<u>points</u>		
MIDDLE School	0 - 19	0	50 - 74	20		
a.m. peak hour (7:35 to 8:30) <u>24</u>	20 - 29	4	75 - 99	24	4	
	30 - 34	8	100-124	28		4
p.m. peak hour (3:15 to 4:00) <u>20</u>	35 - 39	12	125-149	32		
	40 - 49	16	150+	36		
<b>2) Gap Availability</b>						
	<u>crossing distance</u> = <u>100</u> feet	<u>% safe</u>	<u>% safe</u>			
		<u>gap time</u>	<u>gap time</u>	<u>points</u>		
		80 +	45 - 49	20		
		70 - 79	40 - 44	24		
minimum safe crossing time = <u>33</u> seconds		60 - 69	30 - 39	28		
		55 - 59	20 - 29	32		
% safe crossing time = <u>at least 45</u> % a.m.		50 - 54	0 - 20	36	20	
<u>At least 34</u> % p.m.						28
<b>3) Motor Vehicle Speed</b>	<u>mph</u>	<u>points</u>	<u>mph</u>	<u>points</u>		
85th percentile speed = <u>est. 0 - 25</u> mph a.m.	0 - 25	0	36 - 40	6	0	
	26 - 30	2	41 - 45	8		
<u>Est. 0 - 25</u> mph p.m.	31 - 35	4	46 +	10		0
All traffic conflicting with this crossing is turning traffic at a signal, generally from being stopped, so low speed						
<b>4) Sight Distance</b>			<u>design 85th %ile speed</u>	<u>stopping distance feet</u>		
available sight distance: _____ feet _____ bound			25 - 30 mph	200		
			31 - 35 mph	240		
_____ feet _____ bound			36 - 40 mph	275		
			41 - 45 mph	310		
ratio: available sight distance / design stopping distance			46 + mph	350		
			<u>ratio</u>	<u>points</u>		
_____ feet _____ bound			2.1 +	0	0	0
			1.5 - 2.0	1		
_____ feet _____ bound			1.0 - 1.5	5		
			< 1.0	15		
<b>5) Safety History - Previous Five Years</b>						
a) Number of reported crashes at study location involving elementary school children going to or coming from school.			<u>crashes</u>	<u>points</u>		
MIDDLE			0	0		
<u>0</u> reported crashes			1	5	0	0
			each add'l			
b) Reported crashed not involving children going to or coming from school, but of types and/or at times that could conflict with school crossing at this location.				<u>points</u>		
<u>3</u> reported crashes. Type: <u>total crashes last 5 years of types that might</u>				0 - 5	1	1
_____ reported crashes. Type: _____				0 - 5		
_____ reported crashes. Type: _____				0 - 5		
<b>6) Other Factors</b>				<u>points</u>		
Foreign traffic route.				0 to +5	5	5
For each approach in excess of four.				+5		
For complex signal or crossing design.				+5 to +10		
For simple signal or crossing design.				-5 to -10		
Safer crossing one block out of the way.				-10		
Large percentage of grades K and 1 students (over 40%).				0 to +5		
An intersection of two arterial streets where total weekday traffic approach volume exceeds 25,000 vehicles.				+4		
Children crossing multiple crosswalks at an intersection.				0 to +10		
Stopped buses and/or other obstructions.				0 to +5		
Volume of turning traffic not reflected in gap availability.				0 to +5		
<b>TOTAL HAZARD RATING</b>					30	38

## Interpretation of Hazard Rating

Using the hazard rating as a guide, the following measures are appropriate:

1. **Mark as a school crossing** when the hazard rating is greater than 20 points at a crossing used by at least 25 elementary school students during the peak crossing hour. The Traffic Engineer is authorized to mark such a crossing with appropriate warning signs and special crosswalk markings.

2. **Install flashing beacons** if any one of the following conditions is met:

a. The 85th percentile speed is in excess of 40 mph measured at existing school crossing signs which have been in place at least 30 days.

b. The street crossed is a U.S. or State Trunk Highway on which a significant percentage of "foreign " drivers can be expected.

c. The ratio of sight distance to safe stopping distance is less than 1.5.

d. The hazard rating is greater than 30 at an unguarded location where at least 25 elementary students cross and the available safe crossing gaps are less than 50 percent.

3. **Recommend the assignment of an adult school crossing guard** when the hazard rating is greater than 40 points at a crossing used by at least 25 elementary school students during the peak crossing hour.

If the school has only grades K through 2, recommend the assignment of an adult school crossing guard in the hazard rating is greater than 30 points at a crossing used by at least 15 elementary school students during the peak crossing hour.

4. **Recommend the discontinuance of adult school crossing guard protection** at a crossing where the hazard rating falls below 30 points or if the number of elementary school students crossing during the peak hour in less than 15.

At the intersection of two arterial streets where the total weekday entering traffic volume exceed 25,000 vehicles, the total number of students crossing at the intersection will be used to compare to the minimum of 15 students required to retain an adult school crossing guard.

## Remarks

Estimating the gap availability at a signalized intersection where the pedestrian cycle does not come up unless the button is pushed is difficult since unless a pedestrian calls the cycle, there is no acceptable gap. Looking at the potential conflicts, pedestrians crossing the south leg of Rimrock conflict with three movements

- Eastbound right turns on green
- Westbound left turns on green
- Northbound right turns on red

During the morning study, staff observed 22 cycles when Badger Road had the green, which is when pedestrians crossing Rimrock would have the walk cycle if they pushed the button.

During 10 of these 22 cycles there was no turning movements across the south crosswalk.

In 4 additional cycles there was only 1 turning movement across this crosswalk.

There were 5 cycles with 2 conflicting turning movements,

and 2 cycles with 3 turning movements, and 1 cycle with 4 turning movements across the south crosswalk while Badger Road traffic had the green.

Thus the morning gap availability is estimated as at least 45% (10/22 cycles with no conflicts).

During the afternoon study, staff observed 32 cycles when Badger Road had the green

During 11 of these 32 cycles there was no turning movements across the south crosswalk.

During 15 cycles there was only 1 turning movements across the south crosswalk.

There were 5 cycles when there 2 turning movements across the south crosswalk.

1 cycle had 5 turning movements across the south crosswalk when Badger had the green.

Thus the afternoon gap availability is estimated as at least 34% (11/32 cycles with no conflicts)

## Recommendations

Recommend not assigning an Adult School Crossing Guard at this location. Even if these were elementary school students using this crossing, it does not meet the adopted criteria. Changes have already been made to improve the conditions for pedestrian crossings, including adding advance school crossing and school crossing signs by the Town of Madison, lengthening the time a pedestrian has to cross Rimrock, and installation of countdown pedestrian signals.

by Arthur Ross, Pedestrian-Bicycle Coordinator

Date November 28, 2012